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Davidovic, Dragana; Harring, Niklas; Jagers, Sverker C.

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The contingent effects of environmental concern and ideology: institutional context and people's willingness to pay environmental taxes

Dragana Davidovic, Niklas Harring and Sverker C. Jagers

Department of Political Science, Centre for Collective Action Research and the Quality of Government Institute, University of Gothenburg, Sweden

ABSTRACT

Environmental taxes are often argued to be key to more effective environmental protection. People's willingness to pay such taxes in contexts with varying levels of quality of government (QoG) is investigated. Applying multilevel analyses on data from the International Social Survey Programme (ISSP) and the QoG Institute, links between environmental concern, ideology, and QoG are explored. The results show that people who state that they are concerned about environmental issues and live in high QoG countries are more willing than people in low QoG countries to pay environmental taxes. Moreover, people in low QoG countries holding leftist political value orientations are less willing to pay environmental taxes than rightists and other value groups. Environmental concern and leftist political ideology are more important drivers of public support for environmental taxes in high QoG countries than in low QoG countries.

KEYWORDS Environmental taxes; willingness to pay; environmental concern; left-right ideology; political trust; quality of government

Introduction[1]

Environmental problems such as climate change, pollution, and depletion of common pool resources are commonly understood as being rooted in social dilemmas and a lack of collective action. The rationale for this is that, while each actor receives the benefits of their environmental pressure individually, everyone shares the costs of polluting activities collectively, resulting in a strong incentive for individuals to free-ride or to adopt a defective behaviour (to benefit from reduced environmental pressures undertaken by others, while personally refraining from cooperation for the common good). Many environmental problems stem from situations where the short-term benefits to individuals acting in an environmentally harmful manner outweigh the long-term losses shared by everyone collectively,

CONTACT Dragana Davidovic dragana.davidovic@gu.se
Supplemental data for this article can be accessed here.

something that typically limits voluntary cooperative behaviour (Olson 1965, Dawes 1980, Ostrom 1990, Kollock 1998). Therefore, some kind of third actor coordination is often necessary to overcome larger-scale environmental collective action problems. This coordination usually materializes through a government using various forms of policy measures. Intervention in people's lives aimed at increasing collective action is more likely to succeed if the citizenry supports this endeavour.

Studies on the explanatory factors of public support of environmental policy,[2] or willingness to pay for environmental protection,[3] have typically found that people who value or care about the environment and who are generally concerned about environmental issues (who have a *pro-environmental value orientation*), and people who are generally in favour of government intervention (who have a *leftist political value orientation*), tend to be more supportive of environmental policy measures (see, e.g. Stern *et al.* 1999, McCright *et al.* 2014). However, research also shows that factors such as perceived presence of corruption and level of political and social trust influence people's attitudes to state intervention generally (e.g. Di Tella and MacCulloch 2009, Aghion *et al.* 2010, Dimitrova-Grajzl *et al.* 2011, Pinotti 2011, Svallfors 2013) and to environmental policy particularly (see, e.g. Clinch and Dunne 2006, Hammar and Jagers 2006, Kallbekken and Sælen 2011, Harring 2013, 2014, 2016, Harring and Jagers 2013, Kollmann and Reichl 2013).

The state can influence or change people's actions and consumption patterns in many different ways. Economists and policymakers have long promoted market-based policy tools, such as taxes. There are a large number of single country studies on support of and willingness to accept such tools; extensive research exists on public support for green taxes conducted in developed countries (e.g. Alm and Torgler 2006, Clinch and Dunne 2006, Hammar and Jagers 2006, Konisky *et al.* 2008, Jagers and Hammar 2009, Kallbekken and Sælen 2011, Harring and Jagers 2013, Harring 2014). Comparative research has been rare, however (for exceptions, see Kollmann and Reichl 2013, Harring 2014, 2016, Davidovic 2018, Harring *et al.* 2018). Furthermore, previous research has, to our knowledge, not investigated potential interaction effects between individual- and contextual-level variables. Investigating support for environmental protection,[4] Fairbrother (2016) finds that the effects of political and social trust vary cross-nationally,[5] but does not provide any explanations. Moreover, while he does test individual-level interaction effects between environmental concern and political trust and ideology respectively, this does not involve any cross-level interactions. Just as the effects of certain country-level factors can depend on other country-level characteristics (Cf. Povitkina 2018),[6] it is reasonable to believe that the effects of individual-level factors on public support for green taxes depend on certain country-level factors. Exploring public support for environmental taxes, Davidovic (2018) finds an interaction effect between pro-environmental

value orientation[7] and quality of government (QoG) on environmental tax support. However, this study uses a less sophisticated multilevel analysis approach and does not explore interaction effects between left-right political value orientations and QoG.

We investigate whether an interaction effect exists between people's pro-environmental and political value orientation and QoG on public support for environmental taxes. QoG refers to the state's capacity to perform its activities in an efficient, fair, and impartial manner, and without corruption (Cf. Rothstein and Teorell 2008). Specifically, we ask: *are environmentally concerned people equally willing to pay environmental taxes in all contexts, or is this relationship contingent on the quality of government in the respective country?* We hypothesize that the effects of pro-environmental and political value orientations vary cross-nationally and that varying levels of QoG can explain this variation. If people lack trust in the capacity of public authorities to implement environmental taxes in an effective, fair, and non-corrupt manner, they are likely to be less supportive of, or willing to pay, these taxes despite their pro-environmental value orientations. We apply the same reasoning to people's political value orientations and hypothesize that, in high QoG contexts, people with leftist political value orientations have a higher willingness to pay for environmental taxes than rightists and other value groups. In order to test our hypotheses and thereby explain public support for green taxes internationally, we apply multilevel ordered logit regression analysis on data from the International Social Survey Programme Environment III survey (ISSP Research Group 2012) and the Quality of Government Basic Cross-Section dataset (Teorell *et al*. 2012).

We organize the rest of our contribution as follows. Next, we provide our theoretical framework, theoretical model, and hypotheses. Then we present our methodological approach and discuss the data and operationalization of variables, before giving the results of the analysis, which we then analyze and relate to the hypotheses and theoretical model. We conclude by revisiting our original research question and providing suggestions for future research.

Theorizing public support for environmental taxes

Social dilemmas and pro-environmental policy measures

Upholding a clean and healthy environment is commonly considered a collective good. However, the provision of such goods typically constitutes a social dilemma with free-riding possibilities (Kollock 1998, Ostrom 1998). This is because individuals generally choose not to cooperate, but instead engage in activities that benefit themselves but harm the environment and hence the collective, which, unavoidably, decreases the overall provision of

the good. The larger the scale of the public good and the more actors involved, the less likely it is that individuals will take *voluntary* actions to protect the environment (Jagers *et al.* 2019). Even the voluntary actions that some actors supposedly take (so-called unconditional cooperators) will be inadequate, since they will undersupply pollution abatement if the individual costs of such efforts exceed the benefits they and others enjoy (Samuelson 1954, Gächter 2007). Therefore, to induce more actors to undertake substantial efforts, organized coordination or sanctioning systems provided by a third, external party are needed. This external party is usually the state (see Ostrom 1990, Mansbridge 2014).

However, this can generate a new collective action problem. If the sanctions or costs of non-compliance and risks of detecting non-compliance (e.g. tax evasion) are low, actors might tend to enjoy collective benefits while simultaneously ignoring the imposed regulation. From an individual actor's perspective, costly abatement efforts are only meaningful when equivalent contributions by other actors outweigh them, but such contributions are rarely guaranteed. Thus, instead of participating in collective actions, by complying with the policies, the involved parties tend to cheat, e.g., by violating costly regulations or avoiding paying pollution taxes (Cf. Scholz and Lubell 1998).

Tax avoidance and failure of public institutions to collect taxes are generally more severe in low QoG countries (Uslaner 2007). It is generally difficult for people in high QoG countries to cheat on environmental taxes due to the ways in which those states organize, implement, and enforce taxes. Therefore, people in such countries are more likely to trust that others will comply with imposed policies and that implementing authorities will provide something good, e.g., by putting environmental tax revenues to their rightful use. This should in turn translate into public support for green taxes (Kallbekken and Sælen 2011; see also Carattini *et al.* 2019).

In contrast, people in low QoG countries, with low trust in implementing institutions, are less likely to support higher environmental taxes, primarily because they expect tax revenues to be wasted or stolen, through corrupt practices, or even that the tax system has been designed with loopholes allowing for tax evasion or unfair tax loading (Fairbrother 2016).

Pro-environmental and political value orientation, QoG, and environmental policy support

There is a sociological and psychological literature asserting that people's value orientations explain their acceptance of environmental policy instruments. These studies usually use either Schwartz's value scheme (Schwartz 1992) or Inglehart's post-materialist values scale (Inglehart 1995) as their point of departure, and they conclude that holding certain values (e.g., egoistic/altruistic or materialist/post-materialist) creates certain beliefs about environmental

conditions, affecting the formation of both general views and specific attitudes to environmental policy tools, assuming that values affect people's general environmental concern and therefore their acceptance of pro-environmental policies. Thus, environmental psychologists measure values and concerns separately. Here, we use and define pro-environmental value orientation as encompassing both, since our main interest is how environmentally concerned people, who we assume have deeper 'green' values affecting their attitudes and behaviour, react to environmental policy measures in different institutional contexts. Hence, by measuring people's concerns, we also indirectly capture their pro-environmental values.

While previous research has used various scales to capture people's values, the applied measures do not necessarily capture people's *pro-environmental* value orientations. Moreover, research has shown that using only values might be too limited in explaining environmental attitudes and behaviour (Poortinga *et al.* 2004). We therefore focus on capturing people's environmental concerns, which are further down in the 'causal chain' between values and pro-environmental policy support (Stern *et al.* 1999). Environmental concern mediates the effect of values (Hansla *et al.* 2013), but environmental concern can also result from people's values; the reason people have pro-environmental attitudes and concerns may be largely a result of their values. Scholars have shown that values successfully explain environmental concern (Schultz and Zelezny 1999, Franzen and Meyer 2010), which in turn has been found to be a significant predictor of policy support for government regulation and market-based policy tools (Poortinga *et al.* 2004).

We can also see environmental attitudes as being derived from people's political value orientations. That is, people's ideological left-right positions affect their attitudes to state involvement and regulation within the environmental domain. Compared with their rightist counterparts, leftists are typically considered to be more supportive of environmental policies since they are generally more positive toward government regulation and intervention. In contrast, rightists generally prefer a free-market economy and are hence less supportive of market-based environmental policy tools, but they are also less prone to prioritizing environmental issues and concerns in general (e.g. Dunlap and McCright 2008, Hinich *et al.* 2013, Liu *et al.* 2014, Hamilton and Saito 2015, McCright *et al.* 2016). Most research on the effect of ideology on support for environmental policy and environmental protection finds that such support tends to be stronger among people who are more left-oriented (e.g. Neumayer 2004, Konisky *et al.* 2008, McCright *et al.* 2014, Harring and Jagers 2013, Hammar and Jagers 2006; see also Jagers *et al.* 2017a). However, one recent study shows that right-oriented *can* be more supportive of environmental protection than left-oriented individuals and that environmental protection seems to be a political ideological issue in some countries but not in others (Fairbrother 2016).

The literature on comparative environmental opinion often neglects people's perceptions of the third actor (the state) and, specifically, the quality of the state. An extensive political sociology literature elaborates on how political trust and QoG affect public support for state intervention. Scholars argue that people's perceptions of public officials as non-corrupt, efficient, and fair explain attitudes to redistribution, taxes, and government spending. For example, Svallfors (2013) (see also Hetherington 1998, Scholz and Lubell 1998, Rudolph and Evans 2005, Rothstein *et al.* 2012) finds that the perceived effectiveness and fairness of government officials has a strong independent effect on such attitudes. He shows that support for welfare and redistribution policies is greater in high QoG countries, while people in low QoG societies do not trust that public actors have the necessary capacity or bureaucratic discretion to adequately implement policies or reforms (Svallfors 2013, see also Dahlström *et al.* 2013). To some extent, research has confirmed these findings within the environmental sphere, e.g., by showing that corrupt political institutions generate aversion to economic environmental policy tools (e.g., Harring 2014, 2016). In countries with corrupt and inefficient public institutions, people generally exhibit a stronger demand for legal regulations than for instruments based on economic transactions.

Additionally, when evaluating the effects of pro-environmental and political value orientations and QoG on environmental policy support, the existing literature has not looked at potential interactions. Following Fairbrother's (2016) and Davidovic's (2018) recent findings, we argue that the effects of pro-environmental and political value orientations on support for environmental taxes may vary cross-nationally. In order to explain this variation, we consult Svallfors (2013), who finds that the effect of people's egalitarian values (their belief in equality for all people, which characterizes people with leftist orientations) on public attitudes to higher taxes and government spending depends on the perceived effectiveness and fairness of government institutions. Svallfors shows that the effect of such values is stronger in high QoG countries, and that, at low QoG levels, people with egalitarian values in some cases want lower taxes than do people with less egalitarian values. People with egalitarian values, who are usually supportive of welfare and distribution policies, are less willing to support such policies if they live in low QoG societies. If the same holds true for people's pro-environmental and leftist political value orientations, we should expect the positive effect of such orientations on public support for environmental taxes to be stronger in high QoG countries.

Theoretical model and hypotheses

Our theoretical discussion highlights the possibility that QoG may moderate the effect of pro-environmental value orientation (environmental concern) and political value orientation (left-right ideology) on public support for

environmental taxes (willingness to pay environmental taxes). We also expect QoG to have a direct effect on public support for environmental taxes. Figure 1 illustrates these relationships.

From our theoretical model, we derive the following hypotheses:

$H_{1(A)}$: Individuals holding pro-environmental value orientations are generally more supportive of environmental taxes than individuals without such orientations.

$H_{1(B)}$: Individuals holding leftist political value orientations are generally more supportive of environmental taxes than individuals holding rightist or other political value orientations.

H_2: Individuals in high QoG countries are generally more supportive of environmental taxes than individuals in low QoG countries.

$H_{3(A)}$: The positive effect of pro-environmental value orientations on public support for environmental taxes is stronger in high QoG countries.

$H_{3(B)}$: The positive effect of leftist political value orientations on public support for environmental taxes is stronger in high QoG countries.

Methodology, material, and measures

Data

To test our hypotheses, we use individual-level data from the ISSP Environment III survey (ISSP Research Group 2012) covering 39,486 respondents from 30 countries.[8] The ISSP collected the data in 2010 through self-completion

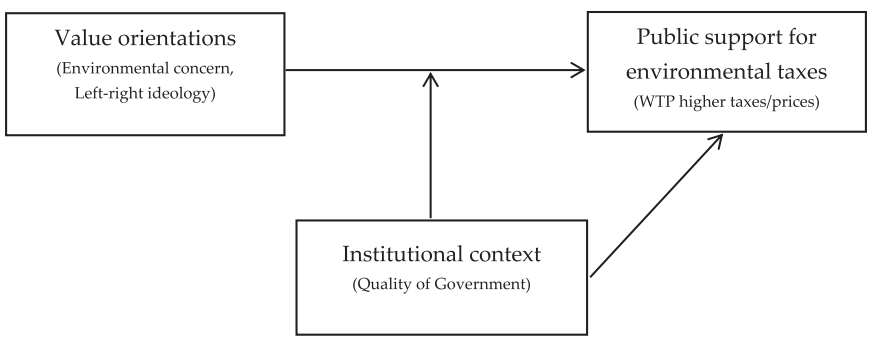

Figure 1. Theoretical model of environmental tax support.

Note: The model shows the moderating effect of QoG on the link between value orientations and environmental tax support.

questionnaires or face-to-face interviews, or both, using survey questions regarding people's environmental concerns and personal views on environmental issues. We merged the ISSP dataset with country-level variables from the QoG Basic Cross-Section Dataset (Teorell *et al.* 2012).

Operationalization of variables

Public support for environmental taxes

The dependent variable is public support for environmental taxes, measured in the ISSP as: 'How willing would you be to pay much higher taxes to protect the environment?', with responses ranging from 'very unwilling' (1) to 'very willing' (5). As a robustness check, we also use the following measure with the same response categories: 'How willing would you be to pay much higher prices in order to protect the environment?' Both are useful proxies for policy support, since willingness to pay is the minimum requirement for attaining any public support for environmental taxes. However, the two measures are problematic for several reasons. First, the reference to *much* higher taxes (and prices) can be interpreted as an increase in the current tax levels in general or in the existing levels of environmental taxes. Second, 'much higher' may also be difficult for respondents to grasp since we doubt that most citizens know how much higher taxes should be in order to induce behavioural change. We use the question to capture people's willingness to pay environmental taxes, i.e., whether such taxes are supported by citizens in various contexts as policy tools to steer people's behaviour in a pro-environmental direction.

Scholars have used these survey questions for many different purposes, including to measure general support for environmental policies, willingness to pay for environmental protection, and willingness to make economic sacrifices for the environment. We believe that we can use them to measure support for a certain type of government intervention, environmental taxes specifically. While the first question captures attitudes to taxes explicitly, the second does so implicitly since taxes usually result in higher prices or fees. The questions are stated in a sense that captures the collective action problem, or free-riding dilemma, of complying with an imposed policy. We emphasize, however, that stated support for a policy does not necessarily mean compliance in practice.

Pro-environmental value orientation

The literature assumes that people's values affect their general environmental concerns and, in turn, their acceptance of environmental policies. Here, we measure pro-environmental value orientation – capturing general environmental concern and, indirectly, values – using a question from the ISSP asking for people's general environmental concerns: 'Generally speaking, how concerned are you about environmental issues?', with responses ranging from 'not

concerned at all' (1) to 'very concerned' (5). Though somewhat vague, the measure is clearly distinct from our dependent variable, since concern does not automatically translate into willingness to take action or pay for environmental protection (Cf. Fairbrother 2016).

Political value orientation

We measure political value orientation using country-specific survey questions from the ISSP concerning people's political party affiliation. The ISSP asked the respondents, for example, whether they consider themselves to be close to any political party, what party they sympathize or identify with, and which party they voted for in the last election. The ISSP then re-coded the responses into a political party affiliation scale containing the following steps: 'far left,' 'left, center left,' 'center, liberal,' 'right, conservative,' 'far right,' 'other,' and 'no party'. We transformed this scale into a dummy variable where 'far left' and 'left center left' equal 1 and all others equal 0.

Political trust

Our main interest is whether people's perceptions of implementing authorities as efficient, fair, and uncorrupt – and whether policy instruments will be handled accordingly – influences their support for environmental taxes. A measure of political trust could partly capture this: 'Most politicians are in politics only for what they can get out of it personally,' with responses ranging from 'agree strongly' (1) to 'disagree strongly' (5). This measure of trust in politicians captures trust in political representatives in general, and scholars have shown that it is more strongly correlated with QoG than measures of trust in government (Harring 2016). It also makes our measure of support for environmental taxes less susceptible to the ideological positioning and level of environmentalism of governing political parties.

Quality of government

To capture the level of QoG in a country, we use the International Country Risk Guide (ICRG) indicator of QoG, which consists of three variables: '*Corruption*,' '*Law and Order*,' and '*Bureaucracy Quality*.'[9] This measure is highly correlated with Transparency International's Corruption Perceptions Index (CPI) (Svensson 2005) and has been shown to produce results similar to both the CPI and the World Bank Estimate of Government Efficiency. We chose the ICRG indicator because we believe that its three dimensions best capture the three dimensions of QoG that we argue are important for environmental tax support, namely perceptions of implementing authorities as efficient ('*Bureaucracy Quality*'), fair ('*Law and Order*'), and non-corrupt ('*Corruption*').

We can expect that, for citizens to accept economic instruments such as environmental taxes they must possess a certain level of trust in both

political institutions and institutions of law and order (Jones *et al.* 2009). Trust in political institutions, including trust in the political system and that those responsible for managing tax revenues (politicians) use them in an effective and uncorrupt manner, will influence acceptance ('*Corruption*') (cf. Kallbekken and Sælen 2011, Harring 2014), as will trust in institutions of law and order responsible for external control mechanisms, that the legal system treats citizens equally, and that citizens comply with public policies ('*Law and Order*'). The level of compliance with public policies by other citizens (social trust) matters for acceptance and perceived effectiveness of market-based policy instruments (Jones *et al.* 2009, Harring 2014).

Moreover, the level of strength and expertise of the bureaucracy, its administrative capacity and bureaucratic discretion matters since actors responsible for the implementation of environmental policy need to be perceived as effective, operating with sufficient discretion in carrying out policy ('*Bureaucracy Quality*') (Cf. Dahlström *et al.* 2013, Svallfors 2013, Harring 2016). Previous public experiences of policy implementation might influence policy acceptance as well (Jagers *et al.* 2017b), which should depend on all three dimensions. We rescaled the variable from a 0–1 to a 0–10 scale, where higher values mean higher QoG.

Controls

We include four control variables at the individual level: *social trust* (i.e., trust in people one does not generally know), *personal income, education*, and *gender*. Previous research has found all these variables to affect views on climate change and public support for environmental protection and pro-environmental policy instruments (Shwom *et al.* 2015) (Appendix 1 – see SOM). We include three control variables at the country level: *economic development, economic inequality* and *environmental quality*.[10]

We use real GDP per capita (2005) as a proxy for economic development. Arguably, it is difficult to disentangle the effects of QoG and economic development (which is beyond the scope of this study) when they are included in the same models as our interaction terms (specifically when testing the interaction between QoG and pro-environmental value orientation). It is, however, problematic to exclude economic development from any analysis dealing with environmental support, provided that economic development has a positive effect on people's support for the environment and ability to pay higher taxes for environmental protection. In particular, it could be the case that economic development (not QoG) explains the relationship between people's pro-environmental value orientation and their willingness to pay environmental taxes, since with economic development come post-materialist values such as environmental protection (Inglehart 1995) that affect people's environmental concern. Therefore, we include it in our analyses.

Research has shown that economic inequality has a negative effect on public attitudes to economic policy instruments (e.g., Harring 2014). A common perception among the public is that environmental taxes will be unfair in the sense that they will affect low earners more than high earners, resulting in aversion. We include a measure of economic inequality based on an income Gini coefficient from the World Income Inequality Database of the World Institute for Development Economics Research. The coefficient ranges from no income differences at all (0) to a hypothetical situation where one person in a country receives all the income (1). We altered the scale so that the country with the highest economic inequality score in our sample equals 1 and the country with the lowest economic inequality score equals 0. When controlling for income inequality, we control not only for plausible negative effects of perceived unfairness on people's support for environmental taxes, but also for the fact that people holding a certain political value orientation may object to higher taxes if they worry more about income distribution than environmental protection.

Environmental quality is another variable we control for, given that the current state of the environment may impact people's demand for environmental policies. Accordingly, we use the Environmental Performance Index, which consists of 24 indicators across ten different categories of environmental health and ecosystem vitality and indicates how close countries are to established environmental policy goals (Environmental Performance Index 2018).

Method: multilevel regression analysis

In order to test our main hypothesis on interaction effects, we apply multilevel ordered logit models to our two levels of analysis – individuals and country context – to see if the individual effects of pro-environmental value orientation (measured as environmental concern) and political value orientation (measured as left-right ideology) are contingent on the country-level factor QoG. The intra-class correlation coefficient shows that a substantial amount of the total variation in public support for environmental taxes, about 5% in the sample, is between countries and is explicable by country-specific effects at the higher level. We are interested in explaining this variation. Moreover, if these country-specific effects are ignored, there is an apparent risk that estimated regression parameters and standard errors will be biased (Guo and Zhao 2000), most likely generating underestimated standard errors and overestimated significance levels (Allison 2009).

The advantage of using multilevel analysis is that we can allow regression parameters to vary, allowing us to assume that countries have different starting points in the level of support for environmental taxes (random intercepts) and that the effects of different predictors (pro-environmental and political value

orientations) might vary cross-nationally (random slopes). To model the latter variation, we use interaction terms in the multilevel models to explain these varying effects.

Results

Table 1 presents the results of the multilevel ordered logit regression analysis using willingness to pay much higher taxes for environmental protection as our dependent variable (see Appendix 2 in SOM for the results using willingness to pay much higher *prices* for environmental protection as dependent variable). Table 1 shows results with all level 1 predictors group-mean centered around country means. We exclude results with group means at level 2 for each group-mean centered level 1 variable, since including the group means did not change our parameter estimates significantly (see Appendices 3 and 4 – see SOM).

As predicted, we find that pro-environmental value orientation is a highly significant predictor of environmental tax support (measured as willingness to pay much higher taxes for environmental protection). The more concerned people are about environmental issues, the more likely they are to be willing to pay higher taxes for environmental protection (.37***). We also find that political value orientation is a highly significant predictor of support for environmental taxes. People who place themselves more to the left on the left-right scale are more likely to be willing to pay higher taxes for environmental protection (.29***). As for our other main variable of interest, we observe that country-level QoG is associated with stronger support for environmental taxes (.15***).[11] Figure 2 illustrates the correlation between QoG and environmental tax support. It shows that, on average, people are less willing to pay much higher taxes for environmental protection in countries with low levels of QoG.

In Models 2 and 3, we introduce individual-level interaction terms (pro-environmental value orientation*political trust and left political value orientation*political trust, respectively), but find no statistically significant interaction effects. In Models 4 and 5, however, where we introduce cross-level interaction terms, we find statistically significant interactions. In Model 4, we find a cross-level interaction term (pro-environmental value orientation*QoG) that is positive and statistically significant (.03***), meaning that as the level of QoG increases, so does the likelihood of environmentally concerned individuals being more supportive of environmental taxes. In Model 5, we observe that the other cross-level interaction term (leftist political value orientation*QoG) is positive and statistically significant (.08***), showing that leftists are more likely than other political value groups to be willing to pay much higher taxes for environmental protection at higher levels of QoG. Moreover, the individual-level left ideology predictor is negative in this

Table 1. Willingness to pay much higher taxes for environmental protection. Multilevel ordered logit regression analysis.

	Model 1	Model 2	Model 3	Model 4	Model 5
Fixed effects					
Level 1					
Environmental concern	0.37***	0.37***	0.37***	0.24***	0.37***
	[0.35,0.39]	[0.35,0.39]	[0.35,0.39]	[0.20,0.28]	[0.35,0.39]
Ideology (left)[a]	0.29***	0.29***	0.29***	0.28***	−0.22***
	[0.24,0.35]	[0.24,0.35]	[0.24,0.35]	[0.23,0.34]	[−0.36,-0.09]
Political trust	0.19***	0.19***	0.19***	0.18***	0.19***
	[0.16,0.21]	[0.16,0.21]	[0.16,0.21]	[0.16,0.21]	[0.16,0.21]
Social trust	0.20***	0.20***	0.20***	0.20***	0.20***
	[0.18,0.22]	[0.18,0.22]	[0.18,0.22]	[0.18,0.22]	[0.18,0.22]
Education[b]					
Lowest formal qualification	0.16**	0.16**	0.16**	0.17**	0.16**
	[0.05,0.26]	[0.05,0.26]	[0.05,0.26]	[0.06,0.27]	[0.05,0.26]
Intermediate secondary completed	0.31***	0.31***	0.31***	0.32***	0.31***
	[0.21,0.41]	[0.21,0.40]	[0.21,0.41]	[0.22,0.42]	[0.21,0.41]
Higher secondary completed	0.50***	0.50***	0.50***	0.52***	0.50***
	[0.40,0.59]	[0.40,0.59]	[0.40,0.59]	[0.42,0.61]	[0.41,0.60]
University degree incomplete	0.66***	0.66***	0.66***	0.68***	0.66***
	[0.56,0.77]	[0.56,0.77]	[0.56,0.77]	[0.57,0.78]	[0.56,0.77]
University degree completed	0.96***	0.96***	0.96***	0.97***	0.96***
	[0.85,1.06]	[0.85,1.06]	[0.85,1.06]	[0.87,1.08]	[0.86,1.06]
Personal income (log)	0.03*	0.03*	0.03*	0.03*	0.03*
	[0.01,0.06]	[0.01,0.06]	[0.00,0.06]	[0.01,0.06]	[0.01,0.06]
Gender (male)	0.08***	0.08***	0.08***	0.09***	0.08***
	[0.04,0.12]	[0.04,0.13]	[0.04,0.12]	[0.04,0.13]	[0.04,0.13]
Level 2					
Quality of Government (QoG)	0.15***	0.15***	0.15***	0.15***	0.15***
	[0.08,0.21]	[0.08,0.21]	[0.08,0.21]	[0.08,0.21]	[0.08,0.21]
Economic development (log)	−0.11	−0.11	−0.11	−0.11	−0.11

(*Continued*)

Table 1. (Continued).

	Model 1	Model 2	Model 3	Model 4	Model 5
	[−0.39,0.16]	[−0.39,0.16]	[−0.39,0.16]	[−0.39,0.16]	[−0.39,0.16]
Economic inequality	0.35	0.35	0.35	0.35	0.35
	[−0.24,0.94]	[−0.24,0.94]	[−0.24,0.94]	[−0.24,0.94]	[−0.24,0.94]
Environmental quality	−0.03	−0.03	−0.03	−0.03	−0.03
	[−0.06,0.01]	[−0.06,0.01]	[−0.06,0.01]	[−0.06,0.01]	[−0.06,0.01]
Interactions					
Environmental concern*Political trust		−0.01			
		[−0.03,0.01]			
Left ideology*Political trust			0.04		
			[−0.01,0.09]		
Environmental concern*QoG				0.03***	
				[0.02,0.03]	
Left ideology*QoG					0.08***
					[0.06,0.10]
Constant					
Cut 1	−3.58	−3.59	−3.58	−3.57	−3.58
	[−7.95,0.79]	[−7.96,0.78]	[−7.95,0.79]	[−7.95,0.80]	[−7.95,0.79]
Cut 2	−2.22	−2.23	−2.21	−2.21	−2.21
	[−6.59,2.15]	[−6.59,2.14]	[−6.59,2.16]	[−6.58,2.16]	[−6.59,2.16]
Cut 3	−1.19	−1.20	−1.19	−1.18	−1.19
	[−5.57,3.18]	[−5.57,3.16]	[−5.56,3.18]	[−5.56,3.19]	[−5.56,3.18]
Cut 4	1.20	1.19	1.20	1.22	1.21
	[−3.17,5.57]	[−3.18,5.56]	[−3.17,5.57]	[−3.16,5.59]	[−3.16,5.58]
Random effects					
Constant	0.14***	0.14***	0.14***	0.14***	0.14***
	[0.07,0.21]	[0.07,0.21]	[0.07,0.21]	[0.07,0.21]	[0.07,0.21]
N (Countries)	30	30	30	30	30
N (Individuals)	29,937	29,937	29,937	29,937	29,937

Comments: *The reported coefficients are unstandardized. Level 1 predictors are centered.* Real GDP per capita and personal income are log-transformed. *$p < .05$, **$p < .01$, ***$p < .001$. *a: reference category = 'all others'; b: reference category = No formal qualification.* Source: *ISSP – Environment III 2010 and QoG Basic Cross-Section Dataset 2012.*

model, meaning that people with leftist political value orientations are less willing to pay much higher taxes for environmental protection than rightists and other value groups in low QoG countries.

Figure 3 illustrates the interaction effect between pro-environmental value orientation and QoG. More specifically, it shows the marginal effects of being 'environmentally concerned' and 'less environmentally concerned' on willingness to pay environmental taxes.

Figure 4 shows the interaction effect between ideological positioning and QoG. More specifically, it shows the predicted probabilities of individuals to the 'left' and 'all others' being 'fairly unwilling' and 'fairly willing' to pay for environmental taxes at different levels of QoG, respectively.

We also find significant effects of our individual-level control variables. People with higher incomes, higher social trust, more education, and men, are more likely to be supportive of environmental taxes. None of our country-level control variables turns out to be significant. More importantly, the effects of both QoG and political trust are quite modest.

Analysis

Unsurprisingly, we find that people with strong pro-environmental value orientations are more likely to be supportive of environmental taxes. We

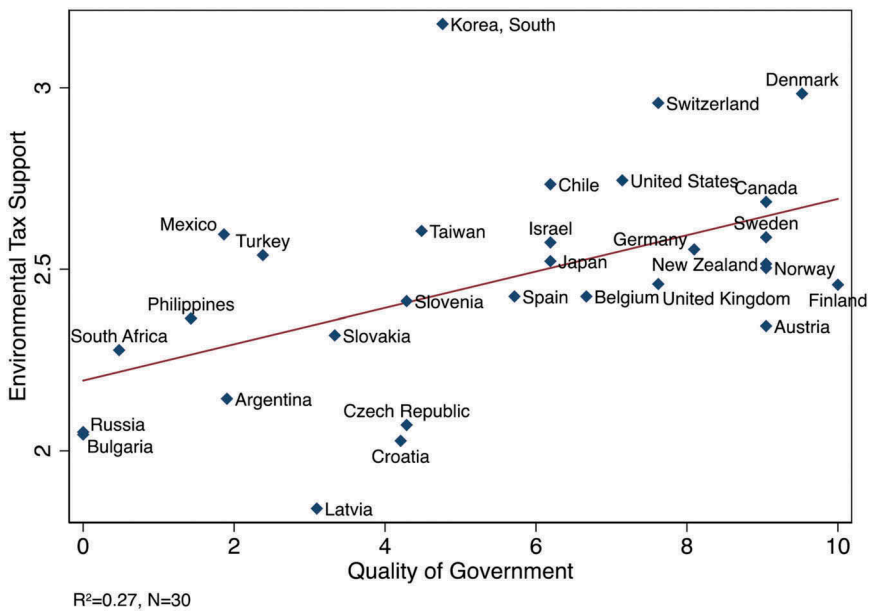

Figure 2. Quality of government and willingness to pay for environmental taxes.

Comment: The graph shows the mean willingness to pay much higher taxes for environmental protection by country across different levels of QoG. Source: *ISSP – Environment III 2010 and QoG Basic Cross-Section Dataset 2012*.

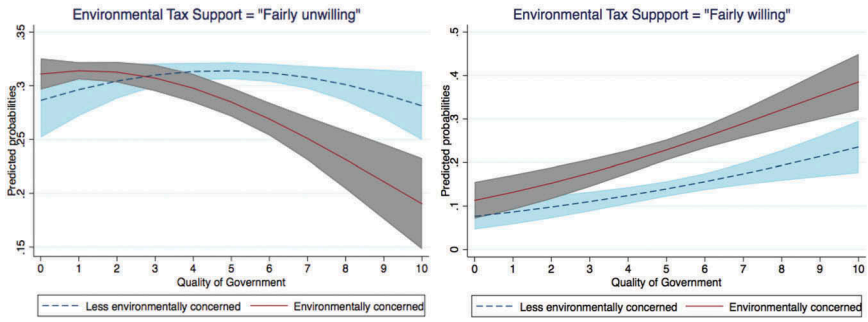

Figure 3. Marginal effect of environmental concern on willingness to pay for environmental taxes at different levels of QoG.

Comment: 95% confidence intervals. The graphs show the predicted probabilities for the two categories 'Fairly unwilling' and 'Fairly willing'. The regressions are multilevel ordered logit models similar to Model 4 presented in Table 1, except that environmental concern (group-mean centered) is divided into two subcategories based on the mean value of environmental concern in each country. The ones above the mean are categorized as 'Environmentally concerned' and the ones below as 'Less environmentally concerned.' Source: *ISSP – Environment III 2010 and QoG Basic Cross-Section Dataset 2012*.

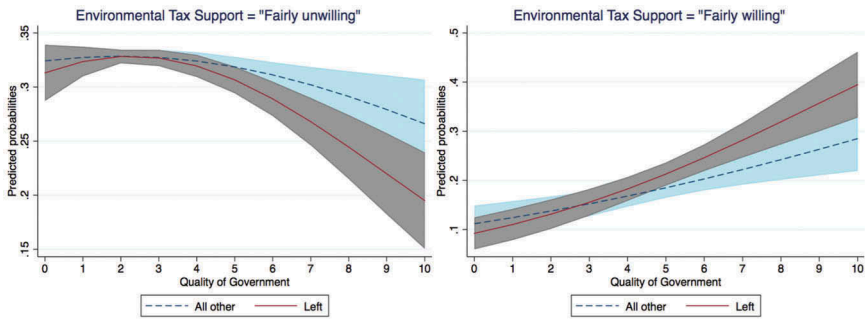

Figure 4. Predicted probabilities of ideological position on willingness to pay for environmental taxes at different levels of QoG.

Comment: 95% confidence intervals. The graphs show the predicted probabilities for the two categories 'Fairly unwilling' and 'Fairly willing'. The regressions are multilevel ordered logit models similar to Model 5 presented in Table 1. Source: *ISSP – Environment III 2010 and QoG Basic Cross-Section Dataset 2012*.

also find that people holding leftist value orientations are more likely than others to support environmental taxes. Hence, we cannot reject the first hypothesis (H_{1A} and H_{1B}). Our results show that QoG has a positive effect on people's willingness to pay environmental taxes. Thus, the data also suggest that we cannot reject our second hypothesis (H_2).

Regarding the interaction effect between pro-environmental value orientation and QoG (H_{3A}), one of our main contributions, we find that environmentally concerned people are more willing to pay environmental taxes if they live

in high QoG countries (see Figure 3). Similarly, we find a significant interaction effect between leftist political value orientation and QoG (H_{3B}). People who are generally in favour of government regulation and steering, are more likely to support environmental taxes if they live in high QoG countries (see Figure 4). At low levels of QoG, leftists are in fact less supportive of taxes than other value groups (see Model 5 in Table 1). Hence, the data suggest that we cannot reject our third hypothesis (H_{3A} and H_{3B}).

These results are similar to those of Svallfors (2013) on the effect of egalitarian values on public support for higher taxes and welfare spending, and suggest that a similar theoretical reasoning is applicable in the environmental domain. People with leftist value orientations living in low QoG societies are generally not willing to support higher taxes for environmental protection, while people with 'green' value orientations are more likely to do so if they live in high QoG societies. We can explain these results as follows: although people with pro-environmental and leftist value orientations are supportive of environmental taxes, they are *even more* eager not to support and provide corrupt, inefficient, and untrustworthy public institutions with additional financial resources that may end up being used for environmentally detrimental rather than environmentally protective purposes.

Fairbrother's (2016) conclusion that political trust is not what 'converts' environmental concern into support for environmental protection appears to be validated by our study. We find no significant individual-level interaction effect between environmental concern and political trust (Model 2 in Table 1), and when interpreting the coefficient of environmental concern in the model with the interaction term between QoG and pro-environmental value orientation (Model 4 in Table 1), environmental concern appears to have a positive effect on willingness to pay for environmental taxes even at low levels of QoG. While Fairbrother finds no significant interaction effects between individuals' political trust and neither environmental concern nor party identification, we find that QoG conditions the effects of environmental concern and left-right ideology on environmental policy support.

The significant interaction effects between QoG and environmental concern and left ideology, respectively, support our theoretical proposition that people's perceptions of government authorities as efficient, uncorrupt, and fair, or trustworthy, influence their willingness to pay higher taxes for environmental protection. While QoG, political trust, environmental concern, and left ideology separately influence and all have positive effects on public support for environmental taxes, the effects of environmental concern and left ideology are stronger when the level of QoG is higher. In fact, the effect of left ideology on environmental tax support is negative at low levels of QoG. However, it is important to emphasize that the moderating effect of QoG is quite modest.

Conclusion

Our aim was to investigate potential interaction effects between individual- and country-level variables to explain public support (measured as willingness to pay) for environmental taxes internationally. We asked the following research question: *Are environmentally concerned people equally willing to pay environmental taxes in all contexts, or is this relationship contingent on the quality of government in the respective country?* We found that QoG is a statistically significant moderator of the relationship between public support for green taxes and environmental concern and leftist ideology, respectively. Therefore, our results support the proposition that the effects of pro-environmental and political value orientations depend on country context. Specifically, the institutional context, or the quality of the third party, seems to matter. The results indicate that environmental concern and leftist political ideology are more important for generating public support for environmental taxes in high QoG countries than in low QoG countries.

To make environmental taxes a suitable solution across diverse country contexts, particularly in developing countries, where tax evasion is likely and often acceptable among the public, building higher QoG and trust in implementing authorities seems crucial. The main challenge in developed countries is how to induce action on global environmental issues and not so much about changing people's orientations – environmental concern is not what is lacking. In less developed or emerging economies, implementing environmental taxes might not be the first priority ahead of other developmental goals. Here, effective implementation is also likely to be obstructed by non-compliance, considering weaker enforcement abilities and the greater risks of tax evasion. Thus, taxes are perhaps not always the best solution to collective action problems. Until people are willing to accept and actually *pay* higher taxes for environmental protection in practice, and public aversion is much lower than public support, other environmental policy tools, such as strict legal instruments might be more attractive and effective in changing people's environmentally unfriendly behaviour.

As in previous research, we are not able to explain all country-level variation in willingness to pay environmental taxes. However, we have been able to identify at least one country-level variable that contributes to this end: QoG. We add to previous research findings on the importance of QoG in explaining public preferences regarding environmental policies and show that QoG requires more attention since it also plays a role in *moderating* the effects of individual-level factors. Further research on the interactions explored here is needed to bring deeper knowledge of the exact interactions. Using other datasets and better measures could confirm or disentangle the proper interaction effects. We encourage scholars to explore these and other

possible interactions, also using other methodological approaches. For example, survey experiments might explore whether the moderating effect of QoG on values goes via political trust or some other factor. Also, looking at other environmental policy tools, in a similar way as willingness to pay for green taxes was explored in this study, can bring more insights into public support for environmental policies generally.

Notes

1. For Appendices, see Supplementary Online Material.
2. For an overview of the explanatory factors of climate policy support, see Drews and Van Den Bergh (2016).
3. We use *support* and *acceptance* of environmental policy and environmental taxes interchangeably. They are defined in terms of attitudes, and we measure attitudes to environmental taxes specifically.
4. Measured as willingness to pay higher taxes and prices for environmental protection – the same measures we use to capture environmental tax support.
5. He does, however, show that the effects of social and political trust on the willingness to pay for environmental protection are quite consistent cross-nationally compared with the effect of party identification.
6. Povitkina (2018) tests whether the association between level of democracy and CO_2 emissions is moderated by, or conditional on, the level of corruption in a country and finds that higher levels of democracy is only associated with lower CO_2 emissions in low-corrupt contexts. These results indicate that corruption may obscure effective implementation of climate policies, of which environmental taxes are on example.
7. Measured as post-materialist values.
8. For a complete list of countries included in our analysis (and sampling details), see Appendix 5 in SOM.
9. *Corruption* measures corruption within the political system. *Law* and *Order* are sub-components measuring the strength and impartiality of the legal system and popular observance of the law, respectively. *Bureaucracy Quality* measures the strength and expertise of the bureaucracy to govern without interruptions in government services or drastic changes in policy. Scores on the ICRG index indicate the mean value of these three variables (Svallfors 2013).
10. We chose not to include a control for current tax level, partly because it is correlated with and to some extent endogenous to our main variable of interest (QoG), but also because, when we included it in our models, its effect was statistically insignificant. It also substantially reduced the number of observations in our analyses.
11. When the group means of all level 1 predictors are included, QoG is significant at the 95% level (0.11*).

Disclosure statement

No potential conflict of interest was reported by the authors.

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